

12. (Twice Amended) The device of claim 1, wherein the interchangeable tooling modules comprise:

a sensor module connected to the base module; and
a brush module connected to the sensor module.

14. (Amended) The device of claim 12, further comprising a second flexible joint flexibly, electrically and releasably connected between the sensor module and the brush module.

15. (Amended) The device of claim 12, further comprising an interchangeable locomotor module connected between the base module and the sensor module.

Remarks

Claims 1, 12 and 14-20 are pending and stand rejected. Claims 1, 12, 14 and 15 are amended in this response. Applicants respectfully traverse the rejections as applied to the amended claims, and offer the following comments.

35 U.S.C. §102(e)

The Examiner rejected claim 1 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,878,783 to Smart. Smart shows an in-pipe vehicle having a train of modules interlinked by suspension modules (17). The train includes a traction module (11), power module (12), manipulator module (13), sensor module (14), drill module (15) and a fusion module (16). The suspension modules that interconnect the modules (11)-(16) are not releasable and the modules (11)-(16) are not interchangeable. There is no teaching or suggestion in the Smart patent that the suspension modules include disconnect features that would allow the operational modules (11)-(16) to be interchanged with each other or with any other modules once they are all interconnected.

Claim 1 of the applicants' application has been amended to recite the interchangeability of the at least two tooling modules of applicants' multi-module pipe repair inspection device and the releasable nature of the flexible joint that connects one of the tooling modules to the base

module. Applicants' device, as recited in claim 1, is not anticipated by the Smart patent. Withdrawal of the rejection under 35 U.S.C. §102 (e) is respectfully requested.

35 U.S.C. §103(a)

The Examiner rejected claims 12, and 14-20 under 35 U.S.C. §103(a) as being obvious, and therefore unpatentable, over the teachings of Smart in view of U.S. Patent No. 5,899,795 to Penza. Claims 1, 12 and 14-20 were rejected under 35 U.S.C. §103(a) as being obvious over Penza in view of Smart.

As explained above, the Smart patent does not disclose or suggest interchangeable modules, nor does it disclose or suggest flexible joints that are releasably connected to the modules (11)-(16) to allow interchangeability. The Penza patent discloses a tubular structure having a centrifugal tool head that performs grinding, cleaning or polishing operations. The Penza device is not modular and therefore does not disclose or suggest interchangeable tooling modules or flexible joints between one of them and a base module, or between them, that would permit modules to be disconnected for interchanging with another module.

In addition to the amendment to claim 1 discussed above, claims 12, 14 and 15 have been amended to state that the modules are interchangeable and that the second flexible joint is releasably connected between the two tooling modules. Claims 12 and 14-20 depend from claim 1, and therefore include all of the limitations of claim 1. Basis for the amendments can be found, for example, in the Specification at page 11, lines 19-25, page 19, lines 6-10 and pages 24, lines 13-26 through page 25, lines 1-9, and Figures 29, 30, 30A and 30B, regarding the interchangeable modules and quick disconnect features and the details of the flexible joint that allow the quick disconnect and the interchangeability of the modules.

The device recited in amended claims 1, 12 and 14-20 is not shown or described in, nor suggested by, the combined teachings of the Smart or the Penza references. The claimed invention is thus not obvious in view of the combination of the Smart and Penza patents. Withdrawal of the rejections under 35 U.S.C. §103 is respectfully requested.

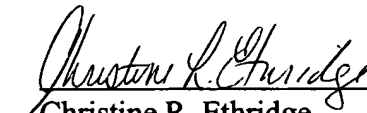
Conclusion

Applicants have made every effort to be fully responsive to the Office Action. Claims 1, 12 and 14-20, as amended, recite a novel and nonobvious device. Reconsideration and allowance

of claims 1, 12 and 14-20 are requested. If the Examiner finds claim1 to be allowable, applicants request consideration of the claims previously withdrawn from consideration.

If the undersigned can be of assistance to the Examiner in advancing the application to allowance, the Examiner is encouraged to contact the undersigned at the number set forth below.

Respectfully submitted,


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MARKED VERSION TO SHOW CHANGES

1. (Amended) A multi-module pipe repair inspection device, comprising:
 - a base module;
 - a microprocessor;
 - at least two interchangeable [one] tooling modules;
 - at least one flexible joint having electrical connection means, said joint flexibly, [and] electrically and releasably connecting the base module to a selected one of the [at least one] interchangeable tooling modules.

12. (Amended) The device of claim 1, wherein the interchangeable tooling modules [is] comprise:
 - a sensor module connected to the base module; and [the device further comprises]
 - a brush module connected to the sensor module.

14. The device of claim 12, further comprising a second flexible joint flexibly, electrically and releasably connected between the sensor module and the brush module.

15. The device of claim 12, further comprising [a] an interchangeable locomotor module connected between the base module and the sensor module.